THE WORK OF THE COLUMBUS BRANCH OF THE BUREAU OF STANDARDS

By HOWARD GUNDLACH, '31

Very few persons are aware that right here on our own campus is a branch of the United States Bureau of Standards. The Columbus branch has its laboratories in Lord Hall and there carries on investigations of a purely ceramic nature. The staff is composed of men employed by the Government although collaborating with them at present are three graduates, working on Fellowships, and one man employed by the American Society of Mechanical Engineers. There are four lines of investigation being conducted at present.

A study of English and American china-clays is being conducted by Mr. Paul Bury for comparison of their qualities and properties, and for a determination of the extent to which American clays can be used to supplant the English ones. Tests have been made on the various types of china-clays used in both countries to determine their specific gravities, shrinkages, particle sizes, strengths, and waters of plasticity. So far, no great differences have been found between the china-clays of the two countries but from further investigation Mr. Bury expects to find wherein the superiority of the English clay lies.

Dr. F. H. Hall is making a study of glazes and their physical and chemical properties to find a means of eliminating "crazing". Crazing is the cracking of the glaze on pottery due to a poor fit between the glaze and the body of the object. It may take place immediately upon removal from the kiln or after several months have elapsed. Crazing may be caused either by a change in the glaze itself, such as volatilization of certain of its constituents; or by a change in the body, rehydration being the most common; or by a chemical reaction between the glaze and the body. In the Study of glazes they are melted into rods and then tested for tensile strength and elasticity, and for determination of their coefficients of expansion and other properties. It is hardly possible to determine perfectly accurate relations between the chemical composition of the original batch and the physical properties of the finished glaze because of the changes taking place during baking and drying. It will be interesting to read Mr. Bury's final report on this investigation as a great step forward will be taken by ceramic industries upon the elimination of crazing.

A study of the shales and alluvial clays of Ohio is being conducted by Dr. A. E. MacGee to determine and compare the properties of the various clays and shales used by the heavy clay industries, such as brick and tile manufacturing. Samples are obtained from different sections of the state and are ground, weighed, slaked, and subjected to many tests. It has been found that there is no great variety in grain size and sandiness among the various specimens of shale, while in the alluvial clay samples the grain sizes and sandiness vary considerably. Also the slaking time of shale has been found to be only from four to thirty minutes while that of clay varies from ten minutes to several hours.

(*Continued on Page* 30)

BUREAU OF STANDARDS

(*Continued from Page* 10)

A study of boiler refractories and a fundamental study of slags formed in boiler firing is being made by Mr. Rexford of the American Society of Mechanical Engineers. Field crews of the Bureau of Mines send in specimens of bricks from boiler set-ups throughout the country and these specimens he examines to determine the extent to which slag has penetrated into them and the weakening effect this penetration, along with mineral deposits, has upon the bricks. This is an especially important work for if a fire brick could be made that would resist the penetration of slag and mineral matter a great amount of money would be saved every year that is now being spent on repairs of broken down refractories.

Working in conjunction with Dr. Hall and Mr. Bury is Mr. Vachuska who is conducting expansion tests on the various glazes and china-clays with the interferometer.

Miss Helen Blair, working for her Master's degree, is making a study in the Bureau laboratories of vitrification by the use of the X-ray. The development of artificial fluxes for ceramic bodies is being undertaken by Paul Collins who is also working for his Master's degree. An investigation of the use of electrolytes in casting slips is being conducted by Paul Mautz who is now working for his Doctor's degree. The expense of these three Fellowships is shared equally by the Experimental Station and the Bureau of Standards.